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## STUDY PROJECT

### THE FUTURE ROLE OF THE SURFACE NAVY IN THE IMPLEMENTATION OF NATIONAL MILITARY STRATEGY -- A LOOK TO 2020

BY

COMMANDER JAMES R. POPLAR III, USN

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USAWC MILITARY STUDIES PROGRAM PAPER

THE FUTURE ROLE OF THE SURFACE NAVY IN THE IMPLEMENTATION OF  
NATIONAL MILITARY STRATEGY -- A LOOK TO 2020

AN INDIVIDUAL STUDY PROJECT

by

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17 January 1990

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# ABSTRACT

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# THE FUTURE ROLE OF THE SURFACE NAVY IN THE IMPLEMENTATION OF NATIONAL MILITARY STRATEGY -- A LOOK TO 2020

## CHAPTER I

### INTRODUCTION

The United States Navy is immersed in an era of dynamic and sweeping change. Changes in the threat, the rapid proliferation and development of new technologies, and an anticipated decline in defense funding will shape the Navy of the future. We have recently witnessed dramatic changes within the Soviet Union which will have a major impact on the execution of the Maritime Strategy. In addition, the recent acquisition of modern weapon systems by Third World countries and the development of new technologies will force the Navy to assess existing strategies. Coupled with these factors is the probability that future defense funding will reduce naval forces. In order to adapt to this rapidly changing environment, the Navy must plan now if it is to be an effective instrument of national power.

In planning for future naval force requirements, and translating those requirements into force capabilities, it is important to consider factors that are specific to the Navy. Shipbuilding is an extremely complex and demanding process. Due to a ship's long life and high initial cost, ship procurement is unique among defense acquisition programs. In addition, naval forces routinely operate independently for extended periods from their support base and must be prepared

to counter a simultaneous air, sub-surface, and surface threat. The Navy is frequently tasked to respond on short notice to a national crisis and does not have the luxury of "working up" to counter a threat. Naval forces must continually be ready and on station. Future naval force requirements are shaped primarily by three factors: strategy -- the National Military Strategy and the derived Maritime Strategy which the naval force structure will be tasked to support; the threat -- the anticipated global force and weapons across the spectrum of conflict which the Navy will encounter while conducting its mission; and lastly the risk -- the acceptable gap between the Navy's capability and the capability of the enemy.<sup>1</sup> This study will focus primarily on these factors and the impact of technology in order to propose the operational requirements and strategy the surface forces of the United States Navy must develop to implement national military strategy.

#### ENDNOTES

1. Strategic Concepts of the U.S. Navy NWP 1 (Rev. A) para. 1.6.



## CHAPTER II

### NATIONAL MILITARY STRATEGY, MARITIME STRATEGY AND IMPACT ON THE SURFACE NAVY

#### NATIONAL MILITARY STRATEGY

National Military Strategy delineates the manner in which the elements of national military power will be employed in support of National Security Strategy. To be effective, it must be integral to the overall national strategy, able to achieve national objectives in the face of an anticipated threat, and capable of adapting to change.<sup>1</sup>

Current National Military Strategy requires military forces be organized, manned, and equipped to deter and, if required, defeat aggression across the entire spectrum of conflict. Our National Security Strategy, global objectives, and the nature of the threat dictate that the United States be prepared to defend vital interests far from her shores.

Major elements that comprise current National Military Strategy include: deterrence both through the maintenance of conventional and nuclear forces, forward deployment of combat ready forces and "flexible response" which will allow our policy makers a full range of military options should force be required to implement national policy. As a recent development, National Military Strategy also tasks the military to be prepared to respond to the increasing threat of terrorism and low intensity conflict in the Third World.<sup>2</sup>

## MARITIME STRATEGY

The maritime component of National Military Strategy is the Maritime Strategy.<sup>3</sup> Although formally articulated a few years ago, Maritime Strategy is an evolving and dynamic plan and remains an achievable means to implement National Military Strategy through the use of maritime resources. A brief overview of the Maritime Strategy is required to enable us to analyze the implications of Maritime Strategy in shaping the future surface navy.

### Background

The goal of the Maritime Strategy is to "use maritime power, in combination with the efforts of our sister services and forces of our allies, to bring about war termination on favorable terms."<sup>4</sup> The strategy provides a framework for the employment of available U.S. and allied maritime resources within the overall objectives of National Military Strategy. The Maritime Strategy can be divided into two phases -- employment of naval forces in peace and utilization during war.

In peace the strategy enables the Navy to deter aggression by the employment of conventional and nuclear forces, conduct naval presence by surface forces, and respond to crises in the world's trouble spots. These have been traditional missions of the Navy. However, Maritime Strategy places great emphasis on cooperation from the Navy's sister services to achieve this end. Forward deployment ensures

continued access to vital resources and unrestricted use of sea lines of communication critical to the maintenance of our economy, as well as the economies of our allies.

The focal point of the peacetime aspect of maritime strategy is rapid crisis response by naval forces to avert the escalation and expansion of conflict. The Navy is in a unique position to be utilized to respond to and deter conflicts. Its forward-deployed posture, high state of combat readiness and mobility make naval forces readily available at crisis locations. Naval forces can be sustained at distant locations with logistic support independent of foreign basing and over-flight rights and can provide the flexibility which the employment of ground forces does not offer.<sup>5</sup>

If the deterrent mission of the Maritime Strategy fails, the "warfighting" aspect of the strategy stipulates that the Navy rapidly transition to a wartime posture, seize the initiative, and carry the fight to the enemy. The requirement for speed, decisiveness, and global forward deployment are crucial to denying an adversary the first salvo and taking the fight to his home waters.

We rely heavily on our allies to conduct operations such as mine warfare and anti-surface warfare in areas close to their home-waters. The strategy also seeks to influence the land battle by limiting redeployment of hostile forces and by ensuring reinforcement and re-supply of friendly forces.<sup>6</sup>

## THE FUTURE OF MARITIME STRATEGY AND IMPACT ON THE SURFACE NAVY

In planning for the surface navy of the future the underlying ideology of the Maritime Strategy will remain unchanged. The United States will always be a maritime nation dependent on the seas both for commerce and as an avenue to exercise national will. Many have criticized the Maritime Strategy as merely a means for the Navy to justify its requirement for six hundred ships, e.g. "The maritime strategy is not a concept for relating means and ends; it is an explanation of how all existing means can be related to all ends."<sup>7</sup>

In spite of criticism, the Maritime Strategy remains a viable future design to employ maritime forces in pursuit of national objectives as long as it is a dynamic strategy responsive to change. It is a concept that is valid across the full spectrum of conflict.<sup>8</sup>

A weakness of the current Maritime Strategy is its fixation on a major "blue water" conflict with the Soviet Union and its limited ability to foresee conflicts with limited objectives. Recent events both within and external to the Soviet Union imply that the next naval battle will not be fought on a grand scale against a major naval power but instead against a Third World naval power with modern weapons in a protracted regional conflict.

We should not ignore the Soviet Union as a threat, but

rather consider the very real possibility that a more likely employment of naval forces will be in a low intensity or limited conflict in areas not clearly articulated in our current strategy. Third World powers are armed with high tech weapons and modern command, control, communications, and intelligence capabilities including sophisticated satellite surveillance and tracking services made available from countries such as France and Japan.<sup>9</sup>

In order to support the concept of limited warfare, the surface navy must be a well balanced force and deploy in areas where we expect to operate in war. The surface force of the future must be capable of operating in support of both joint and combined operations across the entire spectrum of conflict.

Recent experience in the Persian Gulf demonstrated that we can meet a high tech threat, but that even rudimentary technology such as a World War II mine can pose a serious threat to a multi-million dollar open ocean platform.

Our long-range shipbuilding program consists primarily of procurement of the Battle Force Combatant designed to be a multi-purpose platform capable of performing numerous roles independently and with a carrier battle group. While such a platform has its place in support of Maritime Strategy, we should not ignore the "low end" of the spectrum -- mine sweepers, amphibious ships, and small combatants which would be used to support or conduct small scale operations.

The Maritime Strategy will continue to serve as an

effective plan to exercise our national interests; however, it should be a fluid strategy recognizing the impact of changing geopolitics and the Navy's changing role in support of national interests. The surface navy must recognize that in addition to its execution of traditional missions it will play an ever more important role as an instrument of national policy in limited conflicts and must tailor its force structure and strategy accordingly.

We have seen how an evolving Maritime Strategy will impact the surface navy, we shall next assess the impact of technology and the threat in molding the surface navy of the future.

## ENDNOTES

1. NWP 1.1, para. 2.2.1.
2. National Security Strategy of the United States, pp. 26-28.
3. ADM James D. Watkins, USN, "The Maritime Strategy," Naval Institute Proceedings, January 1986, p. 2.
4. Ibid.
5. Watkins, pp. 4-8.
6. Watkins, pp. 8-14.
7. Carl Builder, "The Army in the Strategic Planning Process: Who shall Bell the Cat?" The Rand Corporation, 1987.
8. Long Range Assessment, p. 3.
9. Long Range Planners Conference, p. 11.

## CHAPTER III

### THE IMPACT OF TECHNOLOGY AND THE THREAT ON THE SURFACE NAVY

In addition to an evolving Maritime Strategy, the surface navy of the next thirty years and beyond will be influenced by a rapidly changing technology determining ship design, weapons systems, communications, and a myriad of other areas. The utilization of stealth, automation, and advances in propulsion will become major warfighting capability drivers.<sup>1</sup>

As well as the impact of new technology, the threat also plays a major role in determining future naval force requirements. Undoubtedly the "threat" which not only represents the Soviet Union but Third World nations as well, will incorporate many of the technological advances we will address below in the formulation of their respective naval surface forces.

In this chapter we will first examine the impact of technology on the surface navy and then assess the threat and its implications for future surface force operations.

#### BACKGROUND

#### REVOLUTION AT SEA -- 2020

The Navy has recognized that technology, more than strategy, the threat, or risk, will change the way it builds and fights its ships and has recently embarked on an



ambitious study termed the "Revolution at Sea" to determine the operational requirements and technology plan for its future surface combatants.

The embodiment of the concept of "Revolution at Sea" is the current procurement and projected employment of the battle force combatant or "BFC" which represents a radical departure from conventional surface ship design. The BFC, which will enter the fleet after the turn of the century, will be the first surface combatant to feature main propulsion electric-drive instead of conventional mechanical drive propulsion.<sup>2</sup> The BFC is designed to be the sole class of ship to escort carrier and battleship battle groups rather than the usual assortment of destroyers, frigates, and cruisers.

### IMPACT OF TECHNOLOGY ON SURFACE SHIP DESIGN

#### Propulsion

The most radical departure of the surface ship of the future from its present-day counterparts will be main propulsion. Whereas surface ships of today are driven by steam, gas turbines, or nuclear power, the ship of the future will be driven by an integrated electric drive system. The electric drive system will consist of one or more electric motors and an associated propellor suspended on pods external to the ship's hull to act as the prime mover.

The placement of "propulsor" pods (which resemble massive out-board motors) external to the hull will eliminate

the necessity for the use of power shafts in the drive train. This allows for greater flexibility in ship design (engines can be placed based on convenience and survivability considerations rather than in conventional engineering locations), and will save weight and fuel consumption.

The current Chief of Naval Operations has stated that integrated electric drive will be the method of propulsion for the next class of surface combatants.<sup>5</sup>

#### Communications and Data Processing

Success in any combat environment requires good communications. Not only are rapid and reliable communications with dispersed elements of the battle group required, but the same holds true within the lifelines of individual ships. Future ship designs will place increased reliance on on-board computers for "fighting the ship" integrated with organic command and control networks. We will also see the incorporation of fiber optics and information networks designed to handle data much faster by using light instead of electrons.<sup>6</sup>

The basic problem for any commander is not the generation of more data but how to use and interpret what is available. The Navy will undoubtedly place more emphasis on human engineering in the design of surface ships and look for more efficient ways to display and assimilate the data available to those making decisions. The incorporation of artificial intelligence into the human decision-making process will permit the "filtering" of incoming data by

computers programed to make decisions about what is important and what is not.

### Combat Systems

Technology of the future will not only influence a ship's organic combat system, but will also influence employment of the battle group's weapons. With the anticipated increased speed of anti-ship missiles and attack aircraft, the surface force of the future will be forced to operate in a larger "battle space" in order to effectively engage the threat. The faster the threat, the further out it must be intercepted before it can be engaged. Consequently, the larger the battle space, the greater the necessity of exchanging and evaluating information on the threat held by widely dispersed units.

To engage a threat over an extended area, all ships of the battle group will be equipped to control weapons fired from other ships. Currently only a ship or aircraft is capable of controlling its own missile. A cooperative engagement through the concept "forward pass" will widely expand the area of sea control of the battle group. However, this concept will require extremely reliable and accurate communications and undoubtedly tax the command and control structure of the battle group commander.<sup>7</sup>

The expansion of battle space will also require ships to be more dependent on shore and space based reconnaissance and early warning systems. Soon satellites will provide real-time targeting and relay intelligence and command and control data

from other services. Direct satellite down-link will enable surface ships to fire at distant targets based on locations relayed from remote sensors. This will necessitate extreme navigational accuracy and place increased emphasis on the installation of shipboard inertial navigation systems and reliance on space systems.<sup>8</sup>

The overriding goal of any surface combatant is to deliver "ordnance on target" -- the delivery of weapons to defeat the enemy.<sup>9</sup> The introduction and refinement of the surface launched cruise missile promises to revolutionize the application of firepower for tomorrow's future surface combatant. With the recent introduction of the Tomahawk cruise missile, the surface navy has assumed and will continue to exercise a vital role in strike warfare. This mission has previously been the mainstay of naval tactical aviation.

The advent and refinement of the vertical launching system will permit increased rates of fire to saturate enemy defenses -- ships may be designed to carry hundreds of cruise missiles. Employment of this type of surface ship as a strike warfare platform may be used to back up the aircraft carrier in this role. The aircraft carrier would remain as the primary strike platform, but as their numbers decrease with the budget other formidable strike capable platforms will be needed.<sup>10</sup> We can expect to see dramatic improvements in the range, accuracy, and lethality of these weapons. In addition, interchangeable front end packages will facilitate

modification of missiles for jamming, reconnaissance, or strike missions.<sup>11</sup>

In the foreseeable future, surface ships may incorporate directed-energy weapons or laser weapons incorporated for self defense against air threats and possible use against opposing surface craft. The utilization of high capacity generators to power electric drive units makes available an energy source which could be used to power these weapons systems.

### THE THREAT

It is difficult to predict the course of "Perestroika." Although Soviet leaders claim their military is assuming a defensive posture of "reasonable sufficiency," it would be irresponsible to base our future force structure on their expressed intentions. We must base our planning on their capabilities, not their words.<sup>12</sup>

The Soviet Union will more than likely attain or "borrow" many of the same technical capabilities for its surface forces addressed above. In spite of the current thaw in relations between the United States and the Soviet Union, Soviet expansion into the Third World will likely continue. The world economic environment will also facilitate the spread of advanced technology to Third World countries as well as to industrial nations.<sup>13</sup> Consequently, the Navy must be ready to operate in regional areas dominated by countries that possess advanced military hardware.

The Soviet Union has recently pursued a number of initiatives to advance its maritime warfare capability in response to the capabilities of U.S. naval forces. Such initiatives include: the construction of an SSBN force able launch strikes from Soviet home waters against the continental United States; the unprecedented growth of naval aviation including the construction of aircraft carriers capable of operating fixed wing aircraft; an impressive cruise missile capability; an integrated surveillance, targeting, and command and control systems including the use of space; and the expansion of an overseas base structure capable of supporting the Soviet fleet far from its home waters.<sup>14</sup>

If past experience holds true, the Soviet navy may be expected to follow our lead both in the incorporation of advanced technology into ship design, weapons deployment, and operational doctrine. They will meet our advances in technology with the incorporation and refinement of the same technology into their own navy.

Both the United States and our allies maintain an advantage over the Soviet Union in nearly all areas comprising the conventional maritime balance. However the Soviets may erode some of these advantages (most notably in anti-submarine warfare) as they continue to upgrade their naval forces. Current Soviet submarines are far superior in design, stealth, and capability than their predecessors. Even after they effect the retirement of their

older submarines, their total force will still be over twice as large as the U.S. force.<sup>15</sup> The Soviets have stated that they are attempting to build submarines that "...can travel up to 100 knots submerged, dive to 6,600 feet, and fire 300 knot torpedoes...."<sup>16</sup> Coping with the Soviet submarine force is clearly the greatest challenge the surface navy of the future will face.

Although the Soviet Navy has made recent gains in the construction and deployment of "big deck" aircraft carriers, they will probably not be utilized in the same manner as those in the U.S. Navy. It is anticipated that they will be employed primarily to extend the land-based air defense umbrella to provide greater defense in depth against aircraft and cruise missiles, and will not conduct long range power-projection operations.<sup>17</sup>

In order for our surface navy to maintain an edge over the Soviet navy, it is critical that we optimize the current "revolution" in technology of stealth, information integration, and advances in command and control to our advantage.

## ENDNOTES

1. Long Range Assessment, p. 4
2. "US SURFACE NAVY PLANS AHEAD TO 2020," Armed Forces Journal, p. 65.
3. Ibid., p. 64.
4. Scott C. Truver, "Whither the Revolution at Sea?" Naval Institute Proceedings, December 1988, p. 71.
5. Armed Forces Journal, pp. 65-68.
6. CDR Thomas M. Keithly, "Tomorrow's Surface Forces," Naval Institute Proceedings, December 1988, p. 53.
7. Norman Friedman, THE US MARITIME STRATEGY, p. 216.
8. Keithly, p. 54.
9. Metcalf, pp. 34-39.
10. "IMPLICATIONS OF ADVANCING TECHNOLOGY FOR NAVAL OPERATIONS IN THE TWENTY-FIRST CENTURY," p. 11.
11. Keithly, p. 55.
12. Long Range Planners Conference, p. 12.
13. "IMPLICATIONS," pp. 4-5.
14. Ibid., pp. 54-55.
15. "SOVIET MILITARY POWER," 1989, pp. 130-131.
16. Department of the Navy Report to the Congress 90-91," p. 36.
17. "SOVIET MILITARY POWER," P. 131.



## CHAPTER IV

### RISK

Future naval force requirements are based on strategy, the projected threat and finally risk. Risk is defined as "the degree of assurance that U.S. naval forces could satisfactorily carry out the strategy when opposed by the potential threat."<sup>1</sup>

Naval force levels determined by risk analysis are: the force planning estimate, the objective force, the immediate force goal, and lastly the programmed force.<sup>2</sup>

The force planning estimate is the level of force required to counter the threat, worldwide in simultaneous operations. It provides the highest assurance of naval superiority at a minimum level of risk. The objective force is the naval force level which is capable of providing a reasonable assurance of success in the primary areas of national interest. The immediate force goal is a balanced and flexible force but one that is fiscally constrained. It is an "acceptable risk" force which can maintain combat ready forces capable of executing national strategy against the projected threat. Lastly, the programmed force is one that is fiscally constrained and provides variable capability in meeting critical elements of national military strategy. It is a "marginally acceptable" risk force able to prevail with heavy losses in a major conflict.<sup>3</sup>

In planning for future naval force levels, "risk" is the

most difficult variable to quantify. Not only is the degree of risk influenced by both the strategy and the threat, it is also influenced by such unpredictable variables as future arms control agreements and unforeseen technological advances.

The Surface Combatant Force Requirements Study provides the basis for the Navy's long range surface ship acquisition plan. In terms of risk, the proposed acquisition plan is based on procurement of an objective force, i.e., a surface combatant force capable of providing a "reasonable assurance" of success.

The study concluded the Navy needed a minimum of 224 surface combatants in 2010 -- 120 battle force combatants and 104 escort or "protection of shipping ships."<sup>4</sup> Until the new BFC enters the fleet, the Navy intends to utilize an upgraded or "flight III" ARLEIGH BURKE class destroyer as an interim platform.

The same study recommended the transition of existing surface combatants from front line carrier battle group operations to the protection of shipping role, which includes escort of convoys, underway replenishment groups, and escort of assault ships. The cost of this transition to the 224 ship goal will be about \$4.8 billion in FY 90 dollars.<sup>5</sup>

These surface combatant force level objectives are intended to support 15 carrier battle groups, 4 battleship surface action groups, 1.5 marine expeditionary force, 7 convoys and 10 underway replenishment groups.<sup>6</sup>

In addition to the development of the battle force combatant, the study recommended procurement of a "mission essential unit" a large surface warship to replace the current battle ship and the construction of a "protection of shipping combatant" which would be a follow-on platform to the Navy's current inventory of frigates.<sup>7</sup>

The United States must rely upon a strong and capable surface force to meet its commitments and to deter the growing challenges posed by both Third World countries and Soviet maritime forces. We must have sufficient, ready and sustainable forces capable of operating across the spectrum of potential requirements with minimal risk. In spite of recent rhetoric that asserts the contrary, there is no significant change in the future Soviet maritime threat that would necessitate the restructuring of the surface navy's mission requirements and consequently require a reduction of future force levels.<sup>8</sup>

#### ENDNOTES

1. NWP 1... para. 5.1.
2. Ibid... para. 5.4
3. Ibid.
4. "US SURFACE NAVY PLANS AHEAD TO 2020," Armed Forces Journal, p. 65.
5. Ibid... p. 64
6. Frank C. Carlucci, Annual Report to the Congress for Fiscal Year 1990, p. 144.
7. Scott C. Truver, "Whither the Revolution at Sea?" Naval Institute Proceedings, December 1988, p. 71.
8. Report to Congress, p. 141.

## CHAPTER V

### CONCLUSIONS

The surface forces of the United States Navy will continue to have a very real and vital role in the implementation of future National Military Strategy. The United States is a maritime nation and will increasingly rely on flexible and mobile surface forces to protect vital interests abroad and ensure global stability. The ability to respond rapidly in time of crisis, and to operate with minimal dependence of foreign basing will continue to necessitate the use of a surface fleet rather than "invisible" submarine forces or a land-based army or air force. A surface navy provides visible forward deployed and combat ready forces capable of responding on short notice and remaining independently on station. Unlike land forces, naval forces can not only be employed rapidly but can also be retracted over the horizon. Only a surface force provides our policy makers with inherent flexibility and visibility.

In order to support future National Military Strategy the surface force must be well balanced and capable of operating in support of both joint and combined operations. Not only will the surface navy of the future be required to conduct traditional open ocean missions, but increasingly surface forces will be required to respond to regional conflicts involving Third World countries possessing modern weapons.

Although technology will have a major impact on the

design and employment of surface forces, it will by no means reduce the effectiveness of surface forces to conduct sea control and power projection. Technology will strengthen the position of the surface navy as an instrument of national policy. The anticipated advances in communication, propulsion and integration of systems of battle group units will undoubtedly make the surface navy a formidable weapon to be used in time of peace, crisis or hostilities by our national policy makers.

We have seen that emerging technologies will also make our potential adversaries more formidable. Even though recent changes in the Soviet Union have perhaps lessened our perception of them as a threat, we must remember that our future force should be based on an opponent's capabilities and not his current rhetoric. There is no significant change in the future Soviet maritime threat that necessitates a restructuring or reduction of our future force levels.

Lastly, rather than a "Revolution at Sea," we will more than likely experience an "evolution at sea." Future austere funding and the requirement for ships capable of supporting low intensity conflict will probably preclude the concept of the total revolutionary fleet envisioned by navy planners.

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